



INTEGRATED CIRCUIT

AWM 1338

**48 ELEMENT
SELF SCANNED
PHOTO-DIODE ARRAY**

The AWM1338 is a monolithic MSI linear array of photo-diodes, designed to produce a series of voltage pulses proportional to the integrated incident light intensity on each diode in succession.

This integrated circuit contains a linear array of 48 photo-diodes having $100\text{ }\mu\text{m}$ between centers and each diode is designed to operate in the photo-flux integrating mode. A 50 bit two phase dynamic P-MOS shift register is included to interrogate each photo-diode in turn.

On the initial pass of a single data bit through the register, the diodes are charged and any subsequent light falling on the diodes will discharge them at a rate directly proportional to the instantaneous incident light. A series of output pulses is now produced, each of which is proportional to the amount of energy required to recharge the diodes, during the pass of the data bit in the shift register.

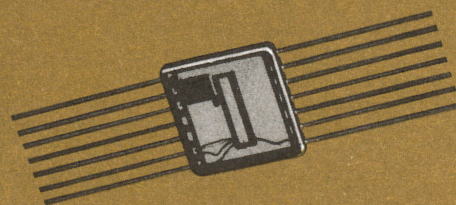
A differential output is provided to minimise multiplexing noise and the high output impedance of the MOS transistor is transformed by a separate bipolar differential amplifier in the same package.

The output appears as a series of voltage pulses, each pulse corresponding to one diode; the amplitude of each pulse being proportional to the total flux that had fallen on the corresponding diode between successive passes of the data bit.

The high uniformity of the output, — better than 10% — makes the array suitable for such applications as facsimile detectors, while the close spacing suits it for position detectors.

GENERAL CHARACTERISTICS

Package	14 lead
Maximum Storage Temperature	125°C
Operating Temperature Range	$0 - 70^{\circ}\text{C}$
Supply Voltage Range	-10 to -20 volts
Operating Frequency Range	10^3 to 5×10^5 Hz
Dynamic Range at 10% uniformity	30 : 1 minimum
Integrate Time	0.01 to 50 mS



14 lead flat pack.
Details on page 4.

APPLICATIONS

- Position detectors.
- Facsimile detectors.
- High speed optical readers.
- Industrial process control.
- Slow scan image converters.

FEATURES

- High speed applications.
- Linear array of photo diode.
- Can be used with A to D converters
- Wide dynamic range.
- Externally variable sensitivity.

Designed and Manufactured in Australia by —

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AWM1338 48 ELEMENT SELF SCANNED PHOTO-DIODE ARRAY

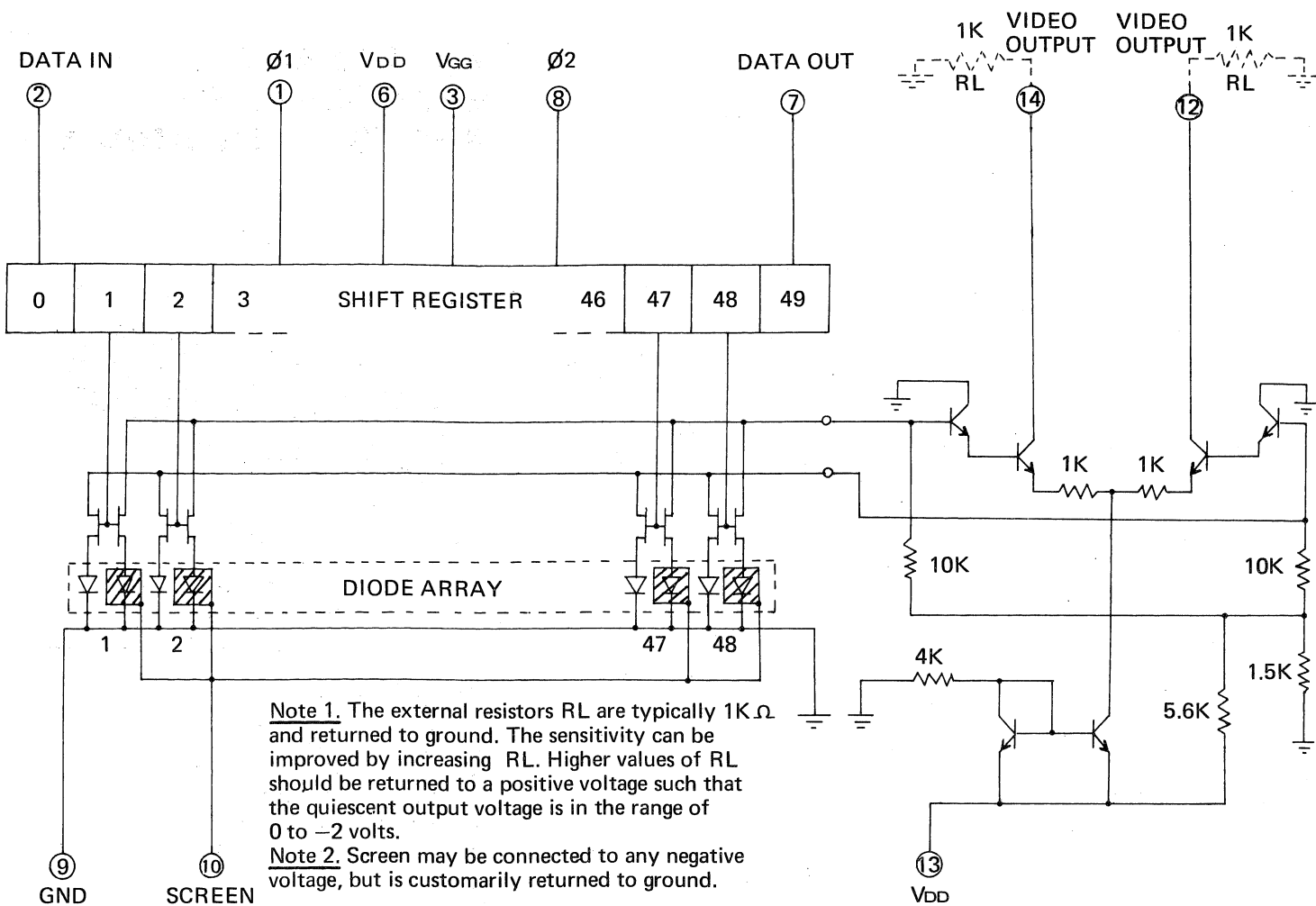


Figure 1. AWM 1338 Functional schematic diagram.

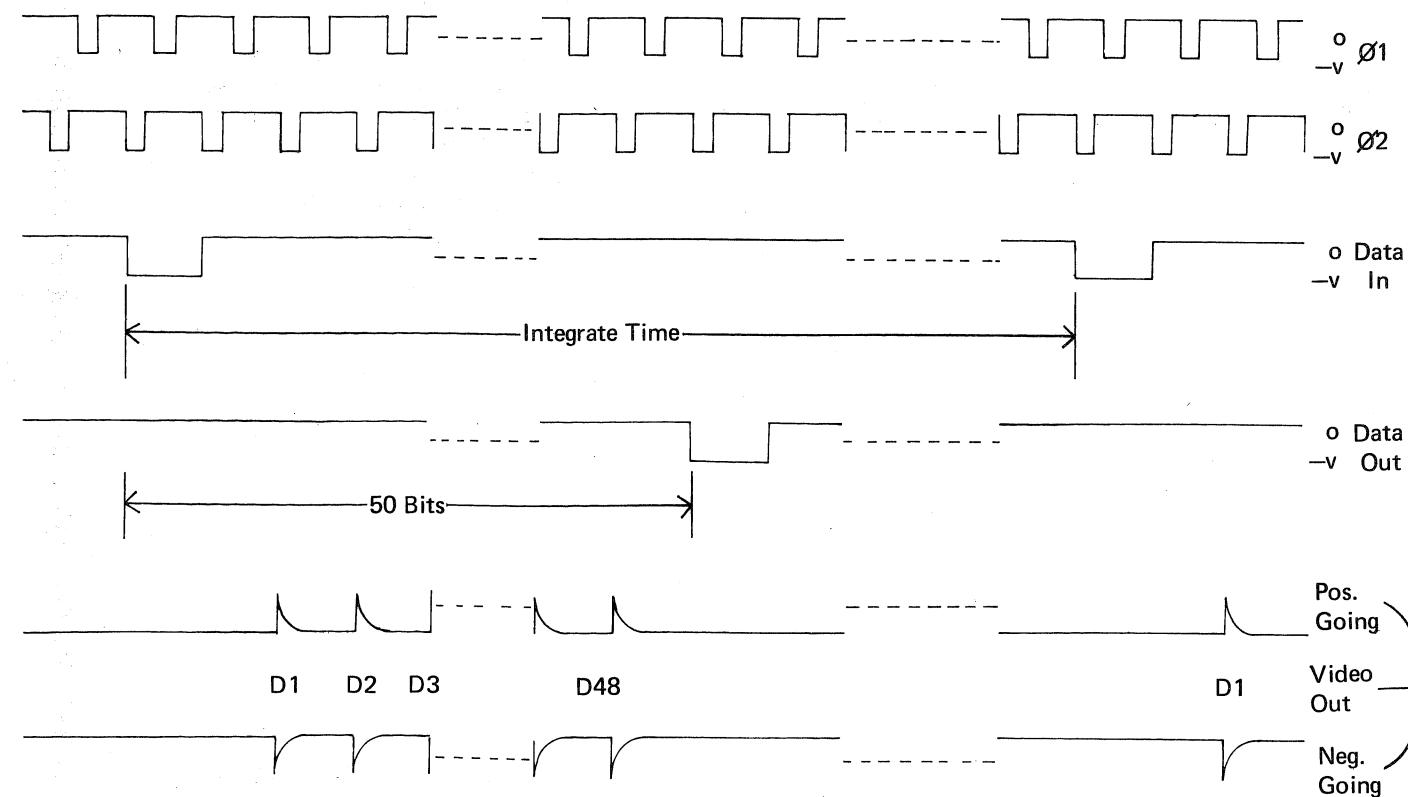


Figure 2. The timing of the output waveforms and their relation to the clock signals.

STATIC AND DYNAMIC ELECTRICAL CHARACTERISTICS

PIN	FUNCTION		Limits			Units
			Min.	Typ.	Max.	
1	Clock in Ø1	Input voltage	-10	-15	-20	Volts
		Clock frequency	10 ³		5x10 ⁵	Hz
2	Data in	High state	-5	-15		Volts
		Low state		-1	-3	Volts
3	Supply	Voltage	VGG	-15	-18	Volts
		Current	IGG		100	µA
4	No connection					
5	No connection					
6	Supply	Voltage	VDD	-10	-15	Volts
		Current	IDD		15	mA
7	Data out	High state	-10	-15		Volts
		Low state		-0.5	-1	Volt
8	Clock in Ø2	Input voltage	-10	-15	-20	Volts
		Clock frequency	10 ³		5x10 ⁵	Hz
9	Ground and case					
10	Screen	Normally grounded or to a negative potential.				
11	No connection	Do not use for any purpose				
12	Negative output	Quiescent conditions: Set Vout between + and - 2 volts by adjusting value of RL	Ic Vout	-2	1.6	+2 mA Volts
13	Supply	Normally connected to VDD, Pin 6.	VDD		-15	Volts
14	Positive output	See pin 12, but with reversed polarities				

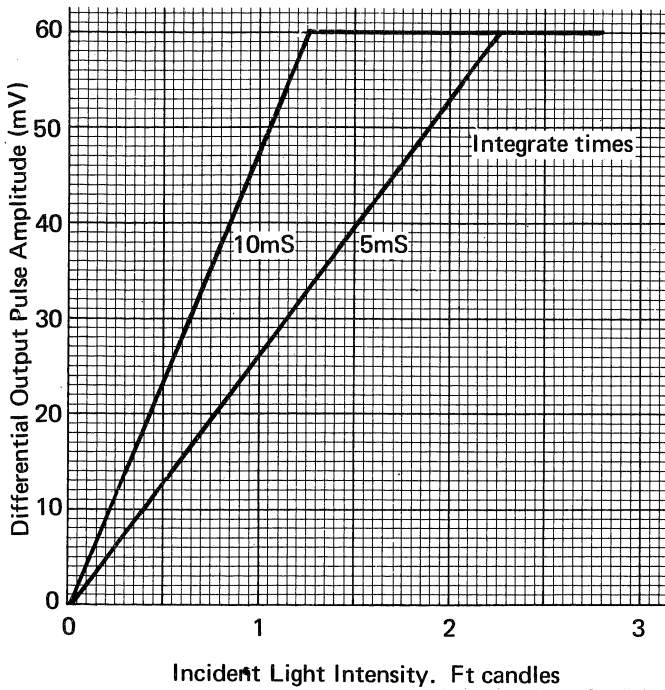


Figure 3. Output pulse amplitude at low incident light intensities

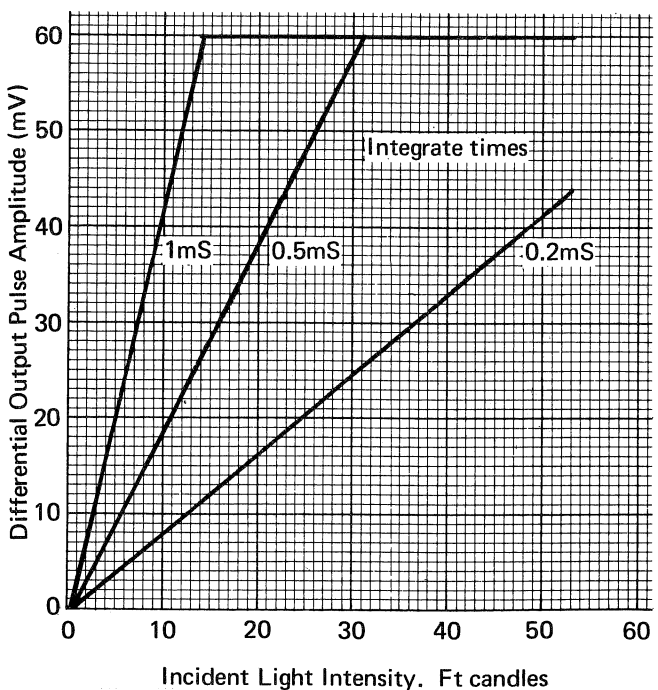


Figure 4. Output pulse amplitude at high incident light intensities

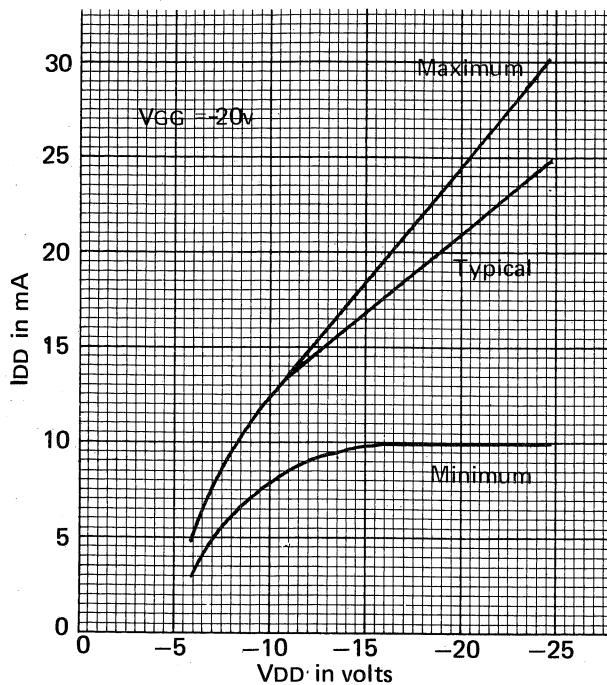


Figure 5 Variation in supply current with constant VGG.

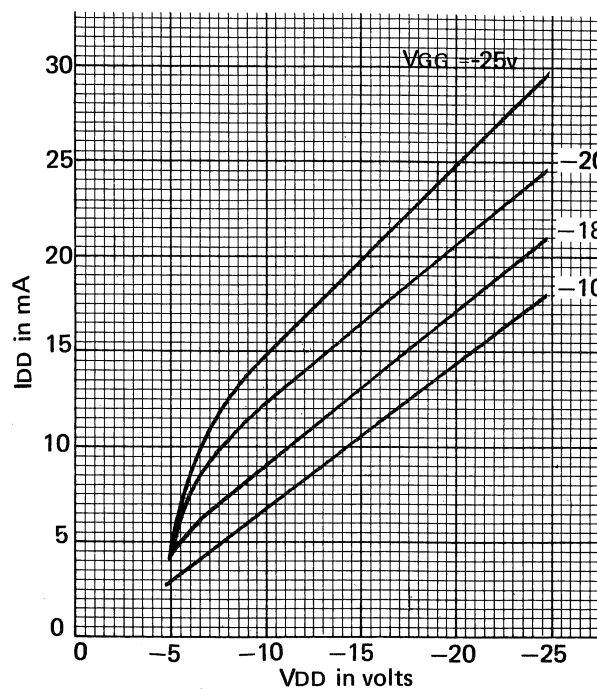


Figure 6 Typical supply current as a function of supply volts with VGG as a parameter.

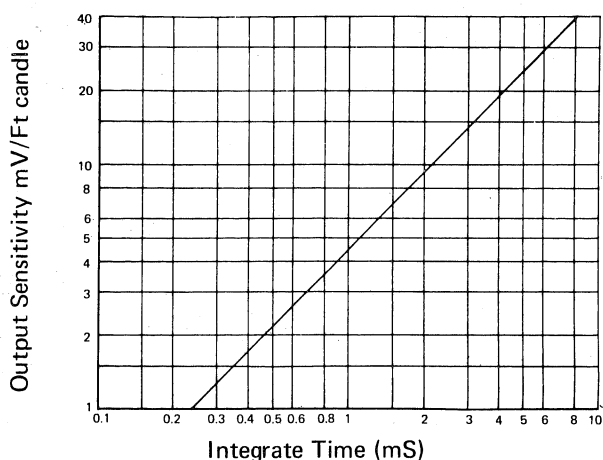
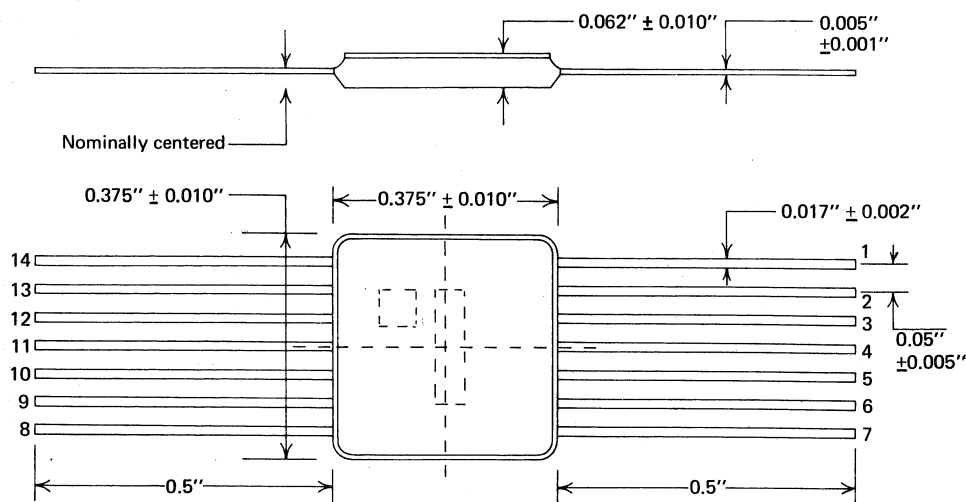


Figure 7.

Sensitivity as a function of integrate time

PIN CONNECTIONS AND DIMENSIONAL OUTLINE

- Pin No. 1. Clock Ø1
2. Data in
3. VGG supply
4. No connection
5. No connection
6. VDD supply
7. Data out
8. Clock Ø2
9. Ground and case
10. Screen
11. Not to be used
12. Output (Negative)
13. VDD supply
14. Output (Positive)



Centerlines of diode array are within
 ± 0.025 inch of package centerlines.
 Pin numbers when viewed from window side.

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